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Climatic Therapeutics in the Treatment
of Pulmonary Tuberculosis.

BY

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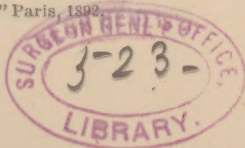
CLIMATIC THERAPEUTICS IN THE TREATMENT OF PULMONARY TUBERCULOSIS.¹

BY EDWARD O. OTIS, M.D.

MUCH of the vagueness and misconception existing regarding the use of climate in the treatment of pulmonary tuberculosis, arises, I believe, from two principal causes: First, a failure to appreciate the supreme importance of the *hygienic* management of the disease; and, second, a false conception of the effect of climate *per se*, and often a too exalted idea of its value, and a blind confidence in it as a panacea. To conduct a case of pulmonary tuberculosis to a successful issue requires infinite attention to details, constant vigilance, and a command of every resource, hygienic, climatic, hydropathic, and medicinal—the latter of the least importance. I am a thorough believer in the great value of climate in the treatment of this disease, and yet I am as thoroughly convinced that it is but one factor, although a very important one, in the complete management of the disease. "Climates are not specific agents," says Daremberg,² "capable in themselves of curing tuberculosis, but simply aids to a method founded upon abundant and careful alimentation, and upon an out-of-door life and rest." "I would," says a specialist in the treatment of pulmonary tuberculosis at a well-known health-resort in a private communication, "take my son or daughter even now to Boston, and there give them the advantage of proper regulations of diet, rest, exercise, out-of-door life, hydropathic measures, rather than to depend upon the best climate

¹ Read before the Norfolk District Medical Society at Brookline, March 27, 1894.

² "Traitement de la Phthisie Pulmonaire," Paris, 1892.



in the world." "A change of climate," says Lindsay, "is likely to prove efficacious only when it is regarded as a preliminary step to a change in the mode of life."³

One of the most woful mistakes, and yet a most common one, is to send a tuberculous patient to a climatic resort where he will be left practically to himself, with no careful and constant supervision of his daily life; what and how he shall eat; when and when not he shall take exercise; how he shall care for his sputum to avoid reinfecting himself and infecting others; what kind of a sleeping apartment he shall occupy; what he shall when he has a rise of temperature; and all the many details necessary for him to know in order to obtain the best available results from his climatic cure. I have seen a patient at one of our well-known health-resorts coming down to the hotel dining-room table for his meals, with the fever of the septic stage of the disease, wasting his little strength in this way when he ought to have been conserving it by rest in bed. I have seen a patient, at the same resort, sitting on the hotel piazza and expectorating his bacilli-laden sputum upon the ground about the hotel, a menace to every occupant of the house; and I do not doubt that among those, not tubercular, who frequent the resort for other reasons, often as "care-takers," there are cases which have become tuberculous in this way. Recently a physician at one of the resorts told me that he was consulted by a consumptive, who said his physician at home — a man of reputation in a large city — sent him there with the advice that he need place himself under no medical care, but simply follow out the directions he received at home; as if this disease, with its infinite variations and changes could be successfully managed a thousand miles away! When climate is so misunderstood and abused in this

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way, is it any wonder that the results of its use are disappointing? Apply the same methods to the use of any of our most valuable medicinal agents, and what would be the result?

Let us clearly keep this fact before us, that climate is but one factor, although a most important one, in the treatment of pulmonary tuberculosis, and unless accompanied by good hygienic conditions, wise and constant medical supervision, it will, in many cases, prove but a delusion and a snare. Hence the importance of well regulated and appointed sanitariums in the climatic resorts. I am fully in accord with Solly's⁴ statement that the percentage of the cured and benefited in these institutions is double that obtained in open resorts. "Experience has shown that nowhere can the necessary daily regulation of the patient's life and habits be so successfully carried out as in a sanitarium, and that the most favorable results in combating the disease have been attained in institutions devoted to this special purpose."⁵

I am thoroughly convinced from my experience and observation that the most successful treatment of this disease in the future, as, indeed, it has been in the past, will be in the sanitariums, and instead of the few that now exist in this great country, hundreds will arise. Look at the marvellous results obtained by Brehmer in his great sanitarium at Göbersdorf, and the equally favorable ones of Dr. von Ruck at the Winyah Sanitarium in Asheville, and of Trudeau's at Saranac. So long, however, as so many of our tuberculous patients do go to climatic resorts where no sanitariums exist, or who will not, from mistaken ideas, enter one, we can do much by wise advice, if we will ever bear in mind the exceeding importance of a care-

⁴ Hare: System of Practical Therapeutics, vol. 1, p. 431.

⁵ Circular of Adirondack Cottage Sanitarium.

fully regulated life for the consumptive in every particular, and place him under a reliable and skilful physician at the resort we may select for him. If we are not sure that these conditions exist, then we should not send him there. With these preliminary observations, without which what I have to say upon climatic therapeutics would be both misleading and of little practical value, I will now consider the effects of the use of climate in the treatment of pulmonary tuberculosis and the condition and stages, both of the individual and the disease, which are most likely to be benefited by it. I shall presuppose that those favorable conditions exist for the proper management of the disease, which I have tried to impress upon you as of paramount importance: and let us always remember that a less ideal climate is rather to be chosen and will produce better results if these other conditions can be more perfectly fulfilled.

In the application of climate to this disease we must remember the principal influences which have been insidiously at work in rendering the lung tissue a favorable soil for the bacillus. In-door life, and in consequence insufficient pure air, malnutrition, lack of physical exercise, defective lung expansion, insufficient sunshine, a damp soil, worry; how much can we depend upon climate to reverse and correct these vicious influences? First, we can give our patient pure, dry, out-of-door air, and surround him with an aseptic atmosphere. Second, we can give him plenty of sunshine. Third, we can place him under such climatic conditions as will induce a better circulation, promote tissue metamorphosis, improve digestion and so increase nutrition and constitutional vigor. Fourth, we can give him attenuated air to breathe (mountain air), which will promote chest expansion and a full, free, and constant lung ventilation. Fifth, the out-door life

will naturally lead to physical activity in cases suitable for it. Sixth, we remove him oftentimes from the vicious conditions which cause his worry, and place him where he will have an attractive environment and under influences which conduce to tranquillity of mind. An abundance of sunshine in itself will often go far towards bringing about this result. Who ever saw a melancholy Italian or negro under their sunny skies? And, lastly, we can give him a dry soil. With some patients means of occupation must be present — sometimes from necessity, and sometimes as a purely therapeutic measure; for to do something, however little, brings hope and health to many a patient, while to sit idly by and await the expected cure, even in the best climate, is only to await disappointment and a fatal issue. Sir Andrew Clark's advice to his patients, to work to the measure of their ability, is sound.

If we will bear in mind the unfavorable conditions and mode of life which produce the disease, and study the conditions and mode of life which exist in those localities which are comparatively exempt from it, we shall be a long ways towards possessing the key to the proper application of climatic therapeutics. It is well to be reminded that climate anywhere, even as unfavorable as ours is, when wisely and fully utilized in connection with good hygienic management possesses possibilities of cure. Tuberculous patients — plenty of them — get well in any and all climates, and often without knowing that they were tuberculous. A year and a half ago or more, a young woman consulted me for a cough and general malaise, in whom I discovered unmistakable evidence of apex catarrh. Not long ago I examined her again, and found that all signs of disease had disappeared and she seemed to be in perfect health. The only climatic change she was able to take was a summer outing. All of you, doubtless, can cite similar instances.

Equally important is it for us to bear in mind that the climatic treatment is not applicable to all cases and all stages of pulmonary tuberculosis. This ought to be a self-evident truth, but from the lamentable and disastrous mistakes physicians make in this respect, it is evident that it is not. To send a tuberculous patient away from home, who has drifted into a septic condition for instance, with fever, anemia, and an irritable heart, is to shorten his life probably, and cause him and his friends unnecessary suffering and distress, besides bringing discredit upon climatic treatment in general. At home and in bed is the place for him.

The question of what cases are proper and suitable to send away for the climatic cure is one which must first be settled, and it is one which must be thoroughly studied in connection with each individual case. The constitution and vigor of the patient; his inherited tendencies; the activity and extent of the disease; his age, habits, temperament, material and social condition, must all be taken into account. We must possess a thorough knowledge of the disease in general in all its phases, and in each individual case, together with its rate of progress; a thorough knowledge of the individual himself; and a thorough knowledge of climates in general; and then are we in a condition to apply wisely, or refrain from applying unwisely, our climatic therapeutics. Incidentally I would here remark that we ought to use all our efforts and skill in detecting the disease at the very earliest moment, the time when it is most amenable to treatment. Why lose precious time in waiting for marked dulness and râles when a slight lack of resonance, a bit of roughened respiration, a hack now and then, and a condition of malnutrition indicate plainly enough that the disease already exists? A pity it is that so few

cases come to us in the pre-tubercular or early tubercular stage, when we could use our climatic therapeutics to the greatest advantage; but unfortunately the hope which "springs eternal in the human breast" leads in this case to a disregard, on the part of the patient, of the inception of the disease and a neglect of obtaining timely medical advice.

"If we have to define the stage of the disease," says Lindsay,⁶ "most suitable for climatic treatment, we should say the quiescent, as distinguished from the active stage, rather than any of the three stages familiar to medical literature. In other words, the first and third stages, provided *they be chronic and inactive*." The second stage, or the stage of septic infection, when the disease is active and accompanied with much pyrexia, is regarded, I think, by most authorities as unsuitable for the climatic treatment; and yet if patients in this stage even could be in a climate such that they could lie on a couch all day out of doors and have equally as good treatment as at home, it seems to me there would be a chance of materially shortening it and more quickly arresting the active morbid process.

Having then taken into consideration all these questions and decided that a given case is a suitable one for the application of climatic therapeutics with the hope of a *cure* or *arrest*, what climate will you select? We have practically but two kinds to choose from, the low and the high. Each must possess certain common characteristics: purity of the air, abundance of sunshine, dryness of the air and soil; and in addition, the higher possesses rarefaction of the air, greater diathermancy, and a more tonic effect. The majority of cases which are proper to be sent away at all, can, I believe, be sent to the medium and high altitudes, for I do have the most thorough conviction that altitude,

⁶ Climatic Treatment of Consumption.

with all its means, materially increases the chances of a cure, other things being equal. Not all cases are suitable for the altitude treatment, some on account of the general condition and some on account of the local. A certain amount of strength and vigor are a prerequisite, I think, especially in the higher altitudes; but I believe the chances are better for a cure or arrest in cases proper for it, than in climates without altitude. One important and common cause of pulmonary tuberculosis, I believe, is insufficient lung expansion and ventilation. The patient may never have learned to breathe properly and fully, and the air he has breathed has been impure indoor air. Now, it is most essential that these conditions should be reversed as soon as possible. He should expand his lungs with pure aseptic air, and that is just what altitude compels him to do. Nature supplies him with the most natural and complete method of pulmonary gymnastics. "The use of natural, rarefied air," says Williams,⁷ "such as we obtain from diminished barometric pressure at high altitude stations yields wonderful results in phthisis." The local effects upon the chest and its contents have been observed to be as follows: hypertrophy, or more complete development of the healthy lung tissue; compression of the diseased parts, through emphysematous dilatation of the neighboring portions of the lung. And in consequence of these changes there is increased thoracic expansion accompanied by diminution of the number of respirations, and a slowing of the pulse. The tonic effect of altitude is increase of appetite, improvement of sanguification and general nutrition, strengthening of the heart and circulation, raising of muscular and nervous energy and of activity of the skin.⁸

⁷ Pulmonary Consumption.

⁸ Weber: Croonian Lectures on the Hygienic and Climatic Treatment of Chronic Pulmonary Phthisis.

As I have before said, to the majority of cases suitable for climatic treatment the medium and high altitudes are applicable. The high altitudes have been found beneficial⁹ (1) in incipient phthisis; (2) cases of imperfect expansion of the thorax; (3) hemorrhagic phthisis; (4) chronic pleurisy and unresolved pneumonia; (5) patients with more advanced disease showing some consolidation, but no excavation nor any serious disturbance; (6) cases of cavity, if not large and the disease is quiescent. As to anemia and the "fibroid phthisis" of Sir Andrew Clark, authorities differ. As to the latter cases I agree with Lindsay, that "if there be a fair amount of functionally active lung, the high altitude climate may be tried."

The contra-indications to the high altitudes are: (1) Advanced age; (2) septic condition, when the disease is active and pyrexia constant; (3) double cavities with or without pyrexia; (4) cases in which there is great irritability of the nervous system; (5) diseases of the kidney, liver, or heart; (6) diabetes; (7) great loss of pulmonary tissue; (8) emphysema; (9) tubercular laryngitis. Observers differ as to the least degree of elevation at which the special characteristics of altitude are manifested, probably, as Solly¹⁰ says, it is about 2,500 feet. I should include in the medium altitudes places of from 1,500 to 3,000 feet, and in the high from 3,000 to 7,000 feet. First, let us consider the available resorts of medium altitude some of which can be utilized the year round, which is better; and others for only portions of the year. In this country we have various places in the highlands of the great Appalachian System. For warmer portions of the year and possibly for the whole year, if proper

⁹ Knight, Weber, Williams, Lindsay, Solly.

¹⁰ Hare : System of Practical Therapeutics, vol. 1, p. 418.

accommodations existed, we have our own White Mountain region represented by such places as Bethlehem and Maplewood 1,459 feet above sea level; Dublin 1,600 feet high; Jaffrey near by; Gilmanton, Whitefield, Jefferson, and others possessing about the same conditions. At Bethlehem and Maplewood the mean temperature of nine seasons for the three summer months was 64.91° F.,¹¹ the relative humidity 65.51° ; and there were on an average only two days each month when an invalid could not go out with safety and comfort. The accommodations are good and abundant.

At Dublin the mean temperature for the four summer months of last year (1893) was 62.45° F.; the average number of clear, partly cloudy, and cloudy days for each of these months was 14.7, 6, 7, or 27.7 days per month when an invalid could presumably be out of doors. The prevailing wind was south-west. The average death-rate for three years (1889-91) was 1 to 99.9, and the average age 72.6 years.¹² Pulmonary tuberculosis is said to be almost wholly unknown in the town. The summer life here is essentially a cottage one.

Next we have various places in the Adirondacks which Osler¹³ says he prefers to other American resorts for early cases. There are very many places of an elevation of from 1,500 to 2,000 feet; Lake Placid, 1,863 feet; Blue Mountain Lake, 1,800 feet; the Lower St. Regis Lake (Paul Smith's), 1,600 feet; Saranac Lake, 1,752 feet. At the latter place is situated the admirable "Adirondack Cottage Sanitarium," with a capacity for 75 patients who have the skilful advice and great experience of Dr. E. Trudeau, who

¹¹ Goddings: Bethlehem and Maplewood, reprint from the *Climatologist*, 1891.

¹² Dr. Hamilton Osgood: private communication.

¹³ *Practice of Medicine*, p. 251.

has done so much work in this department of medicine. "Only those who are in the first stage of consumption or convalescing from other pulmonary diseases, or in the opinion of the examining physicians are likely to be benefited by the sanitarium treatment, and can afford to pay no more than the low price demanded here for board, are admitted."¹⁴ All medical attendance is free, and five dollars a week is charged for board and lodging.

The Asheville Plateau has become well known as a resort of medium altitude, especially through the work of Dr. Karl von Ruck, whose admirably conducted sanitarium is situated in Asheville, which is 2,350 feet high. The mean winter temperature (for four years, 1888-92) is 45.79° F., and the mean summer temperature 65.89° F.; the mean relative humidity is 66.78°, and the mean number of days without sunshine per month is 0.75. Dr. von Ruck, from a record of 500 cases reports a cure or arrest in 35 per cent., and improvement in 56.¹⁵

In South-western Texas and Southern California, inland, are places of an elevation of about 2,000 feet. Boerne, 1,300 feet high, about thirty miles north-west of San Antonio, Texas, is a well-known health-resort in that State, as is also San Antonio itself. The western part of Kansas consists of an extensive plateau of from 1,500 to 4,000 feet, and a mean annual temperature of 49° F. Kansas is said to be a very healthy State and highly favorable to consumptives.¹⁶

Europe is too far away to be available ordinarily, although there are many well-known resorts for pulmonary tuberculosis of medium altitude. Montreux, about 1,200 feet high, and the more elevated regions

¹⁴ Circular of the Adirondack Cottage Sanitarium.

¹⁵ Karl von Ruck: *The Climate of Western North Carolina*, reprint.

¹⁶ Evans: *Phthisiology*.

above it; Les Avants, 3,500 feet; Clion, 2,200 feet; and others are said to give favorable results. I know personally one patient with first-stage phthisis, who seems to have recovered at Les Avants. Then there is Görbersdorf, 1,700 feet high, with its famous sanitarium; and many others in the Pyrenees and lower Alps.

Of the high altitudes I shall speak only of that portion of the eastern slope of the Rocky Mountains lying between the elevation of 4,000 and 8,000 feet, embracing portions of Wyoming, Colorado and New Mexico. Practically the high altitude region is represented to us by Colorado, and is the only region of which I can speak from personal experience. The marvellous results obtained by the high altitude treatment at Colorado Springs and Denver, from which places we have the fullest and most exact reports of cases, are doubtless familiar to you. And when we have more sanitariums constructed on the most approved principles in the Colorado region, the results, I believe, will be still more favorable. Colorado Springs, the elevation of which is 6,022 feet, has a mean annual temperature of about 47° F. and a relative humidity of about 48%. For the three years 1884 to 1887 inclusive, during January and February, there were 106 clear days, 9 cloudy, and 7 stormy days; while in Boston at the same time there were 53 clear, 59 cloudy, and 73 stormy days.¹⁷ According to Solly, during the three winter months, the cloudy days do not average more than three a month;¹⁸ and for five years the average number of clear days at this place was 194, fair 128, and cloudy 43, so that for 322 days the invalid can be

¹⁷ E. O. Otis: Hints to Physicians sending their Consumptive Patients to Colorado, Boston Medical and Surgical Journal, 1887, vol. cxvii, No. 24.

¹⁸ Invalids' Day in Colorado Springs, reprint, 1888.

out of doors and have sun. A day of winter sunshine is about eight hours. Nearly all the other meteorological conditions are also highly favorable; the soil is very dry and "the natural drainage is perfect." There are many other places, in the region about, which probably possess nearly as good conditions as Colorado Springs, but they are not so well known, save Denver, which has the objection of being a large city; but Colorado Springs has probably the best accommodations. I might mention Manitou near Colorado Springs, Idaho Springs, Salida, Georgetown, Boulder, Pueblo, and Estes Park. This latter place is most beautifully situated in close proximity to the mountains and is about 7,000 feet high. With proper accommodations it would be an ideal high altitude resort, and I trust the time will soon come when it will afford well-appointed sanitariums. In Wyoming, we have Cheyenne, 6,052 feet high, with a mean temperature not lower than 43.6° ,¹⁹ and in the north-western portion the famous Yellowstone Park, 6,000 feet high.

New Mexico offers many resorts of high altitude warmer a little than those in Colorado, but otherwise possessing about the same characteristics. I will mention Las Vegas, 6,500 feet high, whose mean annual temperature is 51° , and the humidity about 45; and Santa Fé, 7,000 feet high, of about the same temperature and humidity. The air is very dry. "The skies are commonly clear and the sunshine fine. . . . About 280 days each year are observed as clear and fair."²⁰ I am informed by Dr. Atkins, of Las Vegas, that in both these places there are good accommodations at reasonable rates and good medical attendance. Albuquerque, over 5,000 feet, and Silver City, between 5,000 and 6,000 feet, are also classed, by Dr. Atkins

¹⁹ Evans: Phthisiology.

²⁰ Atkins: The Health of Las Vegas, New Mexico.

in a private communication, among "our best towns." Just beyond the southern border of New Mexico in Texas is El Paso, which has "one of the driest climates in the Union," says Dr. Taylor.²¹ It is 3,950 feet high, has an average temperature of 55.5° F., and a relative humidity of 48; the number of clear and fair days are 330. There are great daily and yearly variations of temperature, but this is more or less the case in all high altitude stations; the accommodations are fairly good, I should think.

The Engadine Valley is the great high altitude resort for pulmonary tuberculosis in Europe; and Maloja, Samaden, Wiesen, Pontresina and Davos are the principal places for invalids, all of which places I have had the pleasure of visiting. The elevation is from 5,000 to 6,000 feet. Davos, 5,124 feet high, is the best known and most frequented of them all. The mean annual temperature is about 37° F., and the mean relative humidity 78. In the yearly average one may reckon 99 clear days, 94 dull, and 17 foggy.²² It is at its best in winter, owing to the great purity of the air, the number of clear days, and the calm atmosphere.²³ The accommodations are excellent and under careful medical supervision; and in this respect it possesses a great advantage over most of our own high altitude health-resorts. For an attractive account of the life there I will refer my readers to the papers of the late J. Addington Symonds, who lived many years there. I have a vivid recollection of the exhilaration produced by the deliciously pure dry air and the warm sunshine.

²¹ The Climate of South-western Texas, etc. Transactions of the American Climatological Association, 1888.

²² *Handbook to the Health Resorts in Switzerland*, by M. Lentscher, M.D., Zurich.

²³ Von Ziemssen's *Handbook of General Therapeutics*. Weber's *Treatment of Disease by Climate*.

In a comparison of the results obtained in high and low (less than 2,500 feet) climates, Solly gives the following *résumé*:²⁴

LOW CLIMATES.

	No. of Cases.	Cured.	Benefited.
All stages	4,167	10%	36%
First stage	714	20	41

HIGH CLIMATES.

	No. of Cases.	Cured.	Benefited.
All stages	709	36½	74
First stage	350	62	84½

As to the length of residence in the selected climate, I can only repeat what I wrote in a paper upon Colorado several years ago:²⁵ "In whatever climate one finds his lung trouble improving steadily, there he should remain, not only until all signs of mischief disappear, but, in many cases at least, as long as he lives."

In closing this paper I cannot give a better summary of the value and limitations of climatic therapeutics than to quote a sentence from Lindsay:²⁶

"Climatic treatment," he says, "is not a complete therapeutics, and will be only a snare if so interpreted. It is a means to an end, not an end in itself; a powerful adjunct to hygienic and medicinal measures, not a substitute for them; a channel of escape from vicious habit and abnormal mode of life, not a mysterious

²⁴ Hare: System of Practical Therapeutics, Art. Climate.

²⁵ Hints to Physicians sending their Consumptive Patients to Colorado, Boston Medical and Surgical Journal, 1887, vol. cxvii, No. 24, p. 569.

²⁶ Climatic Treatment of Consumption.

remedy or an unfailing specific. Much observation and inquiry are still indispensable before its sphere and precise limitations can be fixed with exactness, and the medical profession must be prepared in the future, as they have been in the past, to face much obloquy in their application of a remedy which still defies scientific precision, in this as in so many other departments of knowledge."

"Science moves, but slowly, slowly creeping on from point to point."

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